CLAIMS

1. (currently amended) A method for processing a data signal, comprising:

transmitting ~~the~~ an original data signal through an electrical backplane or through the electrical backplane and at least one filter, wherein:

the original data signal is a binary data signal; and

the transfer function property of the electrical backplane or the transfer function property of the combination of the electrical backplane and the at least one filter corresponds to the transfer function property of a binary-to-duobinary converter; and

receiving the data signal after being transmitted through the electrical backplane or through the electrical backplane and the at least one filter, wherein the received data signal is ~~interpreted~~ processed as a duobinary data signal.

2. (currently amended) The invention of claim 1, further comprising precoding an input binary data signal, wherein the original data signal transmitted through the electrical backplane is based on the precoded binary data signal.

3. (currently amended) The invention of claim 1, further comprising filtering the data signal using the at least one filter prior to ~~interpreting~~ processing the received data signal as the duobinary data signal.

4. (original) The invention of claim 3, wherein the filtering is implemented before transmission through the electrical backplane.

5. (original) The invention of claim 3, wherein the filtering comprises equalizing filtering.

6. (original) The invention of claim 3, wherein the filtering is designed to emphasize high-frequency components in the data signal and flatten group delay of the electrical backplane.

7. (original) The invention of claim 3, wherein the filtering is implemented using an FIR filter.

8. (original) The invention of claim 3, wherein the filtering:

delays a first copy of the data signal;

attenuates the delayed first copy; and

adds the delayed first copy to a second copy of the data signal to generate the filtered data signal.

9. (original) The invention of claim 3, wherein the combination of the filtering and the transmission through the electrical backplane approximates binary-to-duobinary conversion.

10. (currently amended) The invention of claim 1, wherein duobinary-to-binary (D/B) conversion is applied to the received data signal to generate an output binary data signal.

11. (original) The invention of claim 10, wherein the D/B conversion comprises:

comparing amplitude of the received data signal with first and second threshold voltages to generate first and second binary streams; and

applying a logic function to the first and second binary streams to generate the output binary data signal.

12. (original) The invention of claim 11, wherein the logic function comprises an exclusive-OR (XOR) function.

13. (original) The invention of claim 11, wherein the logic function comprises an exclusive-NOR (XNOR) function.

14. (currently amended) The invention of claim 11, wherein:

the output data signal is an NRZ binary data signal; and

the first and second threshold voltages are selected such that one of the first and second binary streams is always zero or always one.

15. (original) The invention of claim 1, wherein the electrical backplane comprises a multi-layer board.

16. (currently amended) The invention of claim 1, further comprising:

precoding an input binary data signal, wherein the original data signal transmitted through the electrical backplane is based on the precoded binary data signal;

filtering the data signal using the at least one filter prior to ~~interpreting~~ processing the received data signal as the duobinary data signal; and

applying duobinary-to-binary conversion to the received data signal to generate an output binary data signal.

17. (currently amended) The invention of claim 16, wherein:

the combination of the filtering and the transmission through the electrical backplane approximates binary-to-duobinary conversion; and

the duobinary-to-binary conversion comprises:

comparing amplitude of the received data signal with first and second threshold voltages to generate first and second binary streams; and

applying a logic function to the first and second binary streams to generate the output binary data signal.

18. (currently amended) A transmission system for a data signal, comprising:

a transmitter subsystem adapted to transmit ~~the~~ an original data signal though an electrical backplane or through the electrical backplane and at least one filter, wherein:

the original data signal is a binary data signal; and

the transfer function property of the electrical backplane or the transfer function property of the combination of the electrical backplane and the at least one filter corresponds to the transfer function property of a binary-to-duobinary converter; and

a receiver subsystem adapted to receive the data signal after being transmitted through the electrical backplane or through the electrical backplane and the at least one filter, wherein the received data signal is ~~interpreted~~ processed as a duobinary data signal.

19. (currently amended) The invention of claim 18, further comprising ~~a~~ the at least one filter adapted to filter the data signal prior to the received data signal being ~~interpreted~~ processed as the duobinary data signal.

20. (currently amended) The invention of claim 19, wherein the at least one filter is designed to emphasize high-frequency components in the data signal and flatten group delay of the electrical backplane.

21. (currently amended) The invention of claim 19, wherein the at least one filter comprises:

one or more delays adapted to delay a first copy of the data signal;

an attenuator adapted to attenuate the delayed first copy; and

a summing node adapted to add the attenuated, delayed first copy to a second copy of the data signal to generate the filtered data signal.

22. (currently amended) The invention of claim 21, wherein the at least one filter further comprises a selector connected to receive an output from each of a plurality of delays and adapted to select one of the delay outputs as the signal applied to the attenuator.

23. (currently amended) The invention of claim 19, wherein the combination of the at least one filter and the electrical backplane approximates a binary-to-duobinary converter.

24. (currently amended) The invention of claim 18, wherein the receiver subsystem comprises a duobinary-to-binary (D/B) converter adapted to apply duobinary-to-binary conversion to the received data signal to generate an output binary data signal.

25. (currently amended) The invention of claim 24, wherein the D/B converter comprises:

a splitter adapted to split the received data signal;

two comparators, each adapted to compare a copy of the received data signal to a specified threshold voltage; and

a logic gate adapted to generate the output binary data signal from outputs from the two comparators.

26. (currently amended) The invention of claim 25, wherein:

the output binary data signal is an NRZ binary data signal; and

the threshold voltages for the two comparators are selected such that one of the comparator outputs is always zero or always one.

27. (currently amended) The invention of claim 18, wherein:

the transmitter subsystem comprises a precoder adapted to precode an input binary data signal, wherein the original data signal transmitted through the electrical backplane is based on the precoded binary data signal;

the system comprises ~~a~~ the at least one filter adapted to filter the data signal prior to the received data signal being ~~interpreted~~ processed as the duobinary data signal; and

the receiver subsystem comprises a duobinary-to-binary converter adapted to apply duobinary-to-binary conversion to the received data signal to generate an output binary data signal.

28. (currently amended) The invention of claim 27, wherein:

the combination of the at least one filter and the electrical backplane approximates a binary-to-duobinary converter; and

the duobinary-to-binary converter comprises:

a splitter adapted to split the received data signal;

two comparators, each adapted to compare a copy of the received data signal to a specified threshold voltage; and

a logic gate adapted to generate the output binary data signal from outputs from the two comparators.

29. (currently amended) Apparatus for processing a data signal, comprising:

means for transmitting ~~the~~ an original data signal through an electrical backplane or through the electrical backplane and at least one filter, wherein:

the original data signal is a binary data signal; and

the transfer function property of the electrical backplane or the transfer function property of the combination of the electrical backplane and the at least one filter corresponds to the transfer function property of a binary-to-duobinary converter; and

means for receiving the data signal after being transmitted through the electrical backplane or through the electrical backplane and the at least one filter, wherein the received data signal is ~~interpreted~~ processed as a duobinary data signal.